



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/577,650

05/01/2006

Takuya Tsukagoshi

127868

2249

25944

7590

08/06/2008

OLIFF & BERRIDGE, PLC

P.O. BOX 320850

ALEXANDRIA, VA 22320-4850

EXAMINER

AMARI, ALESSANDRO V

ART UNIT

PAPER NUMBER

2872

MAIL DATE

DELIVERY MODE

08/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,650	<b>Applicant(s)</b> TSUKAGOSHI ET AL.	
	<b>Examiner</b> ALESSANDRO AMARI	<b>Art Unit</b> 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-24 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-18, 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 19-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/1/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Species A in the reply filed on 02 June 2008 is acknowledged. The traversal is on the ground(s) that a thorough search for the subject matter of any one species would encompass a search for the subject matter of the remaining species. This is not found persuasive because species are based on independent inventions i.e., specific embodiments (Fig.1 – 1<sup>st</sup> embodiment; Fig. 7 – 2<sup>nd</sup> embodiment) and the Applicant has failed to establish that the species are obvious variants. As such, the species are held to be mutually exclusive and examination and analysis of the two separate species would have an undue burden on the Examiner. Thus, the requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 6-8, 19, 20, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by El Hafidi et al (hereafter “El Hafidi”) WO03/049090 (cited as US 7,254,105).

In regard to claim 1, El Hafidi discloses (see for example, Fig. 1, 3) a holographic recording method comprising: splitting a laser beam from a laser beam source (via 129) into an object beam (118) and a reference beam (130); modulating an intensity of the object beam according to information to be recorded (via 119); modulating an incident angle of the reference beam (via 105,110) onto a holographic recording medium (120); and projecting each of the object beam and the reference beam onto the holographic recording medium to thereby form interference fringes, wherein a beam shape of the reference beam is an elongated shape having a minor axis in a plane containing incident optical axes of the reference beam for the respective incident angles and having a major axis in a plane orthogonal to the plane as described in column 8, lines 8-40.

In regard to claim 6, El Hafidi discloses (see for example, Fig. 1, 3) a holographic recording apparatus, comprising: a laser beam source (133); a beam splitter (129) which splits a laser beam emitted from this laser beam source into an object beam and a reference beam; an object optical system (132, 115, 119) which guides the object beam split by this beam splitter to a holographic recording medium (120); and a reference optical system as shown in Figure 3 which guides the reference beam to the holographic recording medium, wherein: the reference optical system is configured to include: a beam shaping optical system (134) which transforms a beam shape of the reference beam into an elongated shape; and an angle modulator (105, 110) which guides the reference beam having the beam shape transformed into the elongated shape by this beam shaping optical system to the holographic recording medium with

an incident angle modulated, which are arranged in this order from the side of the beam splitter as shown in Figure 3; the object optical system is configured to include: a spatial light modulator (119) which modulates an intensity of the object beam according to information to be recorded; and a Fourier lens (115), which are arranged in this order from the side of the beam splitter; and the beam shaping optical system is configured such that a minor axis of the elongated shape is coincident with an angle multiplex direction by means of the angle modulator as shown in Figure 3 and as described in column 8, lines 8-40.

In regard to claim 19, El Hafidi discloses (see for example, Fig. 1, 3) a holographic recording medium having a holographic recording region in which information is angle-multiplex recorded as interference fringes of an object beam and a reference beam as described in column 8, lines 28-57, wherein the holographic recording region has a recording unit (131) which is formed into an elongated shape as viewed from an incident direction of one of the object beam and the reference beam and a minor axis of the elongated shape is coincident with a direction of angle multiplex recording as shown in Figure 3 and as described in column 8, lines 8-40.

Regarding claim 2, El Hafidi discloses that the major axis of the elongated beam shape of the reference beam is coincident with an outer diameter of a beam shape of the object beam as shown in Figure 3.

Regarding claims 3, 8, 20 and 21, El Hafidi discloses that the beam shape of the reference beam is one of an elliptical shape and a rectangular shape as described in column 8, lines 8-40.

Regarding claim 7, ElHafidi discloses that the beam shaping optical system (134) comprises at least one cylindrical lens which narrows the beam shape of the reference beam in a direction of the minor axis as described in column 8, lines 8-19.

Regarding claim 22, El Hafidi discloses that the beam shape of the reference beam is one of an elliptical shape and a rectangular shape as described in column 8, lines 8-40.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8, 19, 20, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al (hereafter "Wilson") US 2003/0067639 in view of King et al (hereafter "King") US 6,721,076.

In regard to claims 1, 6 and 19, Wilson discloses (see Figure 1) a holographic recording apparatus, comprising: a laser beam source as described in para. [0034]; a beam splitter which splits a laser beam emitted from this laser beam source into an object beam and a reference beam as described in para. [0034]; an object optical system (17, 25, 18, 27, 19) which guides the object beam split by this beam splitter to a holographic recording medium (13); and a reference optical system (10) which guides the reference beam to the holographic recording medium, wherein: the reference optical

system is configured to include: a beam shaping optical system which transforms a beam shape of the reference beam into an elongated shape as described in para. [0025]; and the object optical system is configured to include: a spatial light modulator (26) which modulates an intensity of the object beam according to information to be recorded; and a Fourier lens (17, 18, 19), which are arranged in this order from the side of the beam splitter; and the beam shaping optical system is configured such that a minor axis of the elongated shape is coincident with an angle multiplex direction by means of the angle modulator and a beam shape of the reference beam is an elongated shape having a minor axis in a plane containing incident optical axes of the reference beam for the respective incident angles and having a major axis in a plane orthogonal to the plane and the holographic recording region has a recording unit which is formed into an elongated shape as viewed from an incident direction of one of the object beam and the reference beam and a minor axis of the elongated shape is coincident with a direction of angle multiplex recording as shown in Figure 1. Although the prior art does not specifically teach an elongated beam shape, this is seen as an inherent teaching of the device since the disclosed cylindrical lens of the reference optical system will cause the beam shape to conform to an elongated or elliptical shape.

However, in regard to claims 1, 6 and 19, Wilson does not teach angle multiplexing.

In regard to claims 1, 6, and 19, King teaches an angle modulator which guides the reference beam with an incident angle modulated as described in column 2, lines 38-59.

The known technique of angular multiplexing would have predictably resulted in increasing the storage density of the holographic medium. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize angular multiplexing as taught by King in the holographic recording apparatus/method of Wilson in order to increase recording capacity.

Regarding claim 2, Wilson discloses that the major axis of the elongated beam shape of the reference beam is coincident with an outer diameter of a beam shape of the object beam as shown in Figure 1.

Regarding claims 3, 8, 20 and 21, Wilson discloses that the beam shape of the reference beam is one of an elliptical shape and a rectangular shape as shown in Figure 1 and as described in para. [0025]. Although the prior art does not specifically teach an elliptical beam shape, this is seen as an inherent teaching of the device since the disclosed cylindrical lens of the reference optical system will cause the beam shape to conform to an elliptical shape.

Regarding claim 7, Wilson discloses that the beam shaping optical system (10) comprises at least one cylindrical lens which narrows the beam shape of the reference beam in a direction of the minor axis as described in para. [0025].

Regarding claim 22, El Hafidi discloses that the beam shape of the reference beam is one of an elliptical shape and a rectangular shape as shown in Figure 1 and as described in para. [0025]. Although the prior art does not specifically teach an elliptical beam shape, this is seen as an inherent teaching of the device since the disclosed



Art Unit: 2872

cylindrical lens of the reference optical system will cause the beam shape to conform to an elliptical shape.

Regarding claims 4 and 5, Wilson in view of King discloses the invention as set forth above but does not teach wherein a ratio between the minor axis and the major axis of the elongated shape is 2:3 to 3:8. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the ratio between the minor axis and the major axis as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust the ratio to improve the alignment of the object and reference beams so as to improve the recording of the interference fringes. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235

### ***Allowable Subject Matter***

6. Claims 14-18, 23 and 24 are allowed.
7. Claim 14 is allowable for at least the reason, "a distance of the address detector from the holographic recording medium is set such that beam spots on lines extending the reference beam having passed through the holographic recording medium for respective incident angles are adjacent to each other with a spacing therebetween on a light receiving surface" as set forth in the claimed combination. Claims 15-18, 23 and 24 are allowable due to their dependence on claim 14.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALESSANDRO AMARI whose telephone number is (571)272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ava  
01 August 2008

/Alessandro Amari/  
Primary Examiner, Art Unit 2872